marco
POURING PERFECTION

Qwikbrew 2

Service Manual

Marco Beverage Systems Ltd. 63d Heather Road, Sandyford Industrial Estate, Dublin 18, Republic of Ireland	Ireland Tel: (01) 295 2674 Ireland Fax: (01) 295 3715
	UK Tel: (0207) 2744577 UK Tel: (0207) 9788141

Contents

	Page
1. Introduction	3
2. Safety instructions	4
3. General description	5
4. Installation	8
5. Start Up	9
6. Operation	9
• Brewing Coffee	10
• Hot water	10
• Lock function	11
7. Hygiene	11
8. Technical Data	12
• Access to Internal Components	12
• PCBs	12
▪ PCB Brewer Display	12
▪ PCB Timer Single 2002	15
▪ PCB Brew Board 2002	16
• Probes	19
• Element	20
• De-scaling the tank	20
• Pipework and Sprayhead	22
9. Wiring Diagrams	24
10. Amendments	27
11. Spare Parts List	35

1. INTRODUCTION

The information provided in this manual is intended to assist in the installation and maintenance of the Marco Qwikbrew 2 Boiler Brewer. Please read the instructions carefully to prevent accidents and ensure an efficient installation.

This manual is not a substitute for any safety instructions or technical data affixed to the machine or its packaging. All information in this manual is current at the time of publication and is subject to change without notice.

Only technicians or service providers authorised by Marco should carry out installation and maintenance of these machines.

Marco accepts no responsibility for any damage or injury caused by incorrect or unreasonable installation and operation.

2. SAFETY INSTRUCTIONS

1. **Read all instructions.**

2. **To protect against electric shock do not immerse cord and plugs in water or other liquid.**

3. **Do not let cord hang over edge of table or counter; or touch hot surfaces.**

4. **Switch off at mains (unplug from outlet) and turn off water supply when not in use and before cleaning. Allow to cool before putting on or taking off parts.**

5. **Do not operate any appliance with a damaged cord, plugs, or after the appliance malfunctions or has been damaged in any manner.**

6. **The use of spares and accessories not recommended by Marco may cause damage and/or injuries.**

7. **Do not use outdoors. Do not place on or near a hot gas or electric burner.**

8. **Close supervision is necessary when the appliance is used by or near children.**

9. **Do not use the appliance for anything other than its intended use.**

10. **Save these instructions.**

3. GENERAL DESCRIPTION

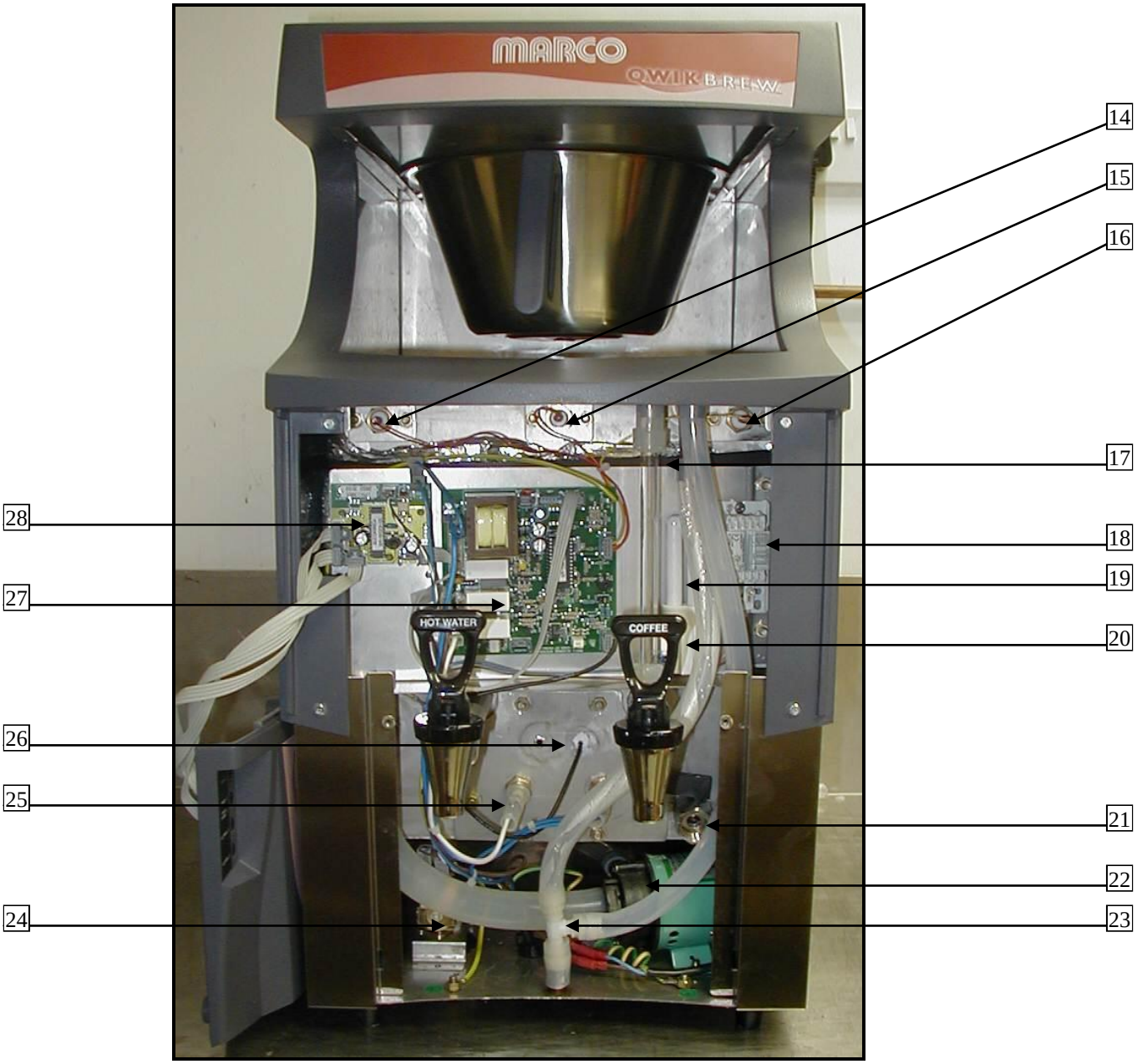
Qwikbrew 2 – 2.8kW

Performance	**Coffee output: Half Brew** **Full Brew** **Hot Water: Immediate Draw Off** **Total Recovery at 2.8kW:**	Up to 3.4 litres (6 pints) Up to 6.8litres (12 pints) 5.5 litres (10pints) 0.48litres/min (0.85pints/min)
Electrical	**Connection**	230V 2.8kW c/w 1.5m flex + 13A plug
Plumbing	**Fittings** **Pressure**	0.75" BSP Food grade inlet hose supplied 5-50 psi (35-345 kPa)
Dimensions	**Height** **Height incl. Cup Rail** **Width** **Depth** **Depth incl. Drip Tray**	705mm 775mm 365mm 440mm 575mm

Fig.1 - General Arrangement

Description	Description
1. Cup Rail - **1801510**	9. PCB Brew Display (switches) - **1600324**
2. Label Header Marco - **1900690**	10. Tap Coffee - **2100295**
3. Basket complete - **2300085**	11. Tap Hot Water - **2100275**
4. Urn Lid - **2300350**	12. Curved Panel
5. Plastic Body - **1801480**	13. Drip Tray Complete (255mmX186mm)- **2300299**
6. Plastic Service Face - **1801490**	
7. Label Face - **1900700**	
8. Label Controls - **1900710**	

Fig.2 - Internal Arrangement



Description and Part Number	Description and Part Number
14. Probe Brew Level - **2301310**	22. Pump Nikkiso - **1501540**
15. Probe High Level - **2301300**	23. Tee Plastic Overflow - **1801250**
16. Probe Low Level - **2301320**	24. Inlet Solenoid Valve – **1502190 (1502170 see amendments/part list)**
17. Sight Glass - **1700260**	25. Element 2.8kW 230V – **1500975**
18. Lamp Ballast – **1501211**	26. Thermistor Assembly - **1600691**
19. Lamp – **1501213**	27. PCB Brew Board – **1600321 (1600326 – see amendments/parts list)**
20. Lampholder - **1501212**	28. PCB Timer – **1600322 (1600323 – see amendments)**
21. Drain Valve - **2100100**	

4. INSTALLATION

Plumbing:

1. Fit a stop valve on a cold water line and attach a ¾" BSP male fitting (e.g. ¾" x ½" 311 or washing machine type stop valve).
2. Connect straight tailpiece of the hose to the stop valve fitting. Make sure that pre-attached sealing washer is secure.
3. Connect right angled tail piece of the hose to the inlet valve of the boiler (again ¾" BSP).
   Make sure pre-attached sealing washer is also secure here - see Figure 3.
4. Turn on water supply and check fittings have sealed.
5. A hose is not a permanent connection so it is advisable to close the stop when not in use.

Electrical:

A moulded 13A plug is factory fitted. A suitable 13A outlet is all that is required.

Fig.3 – Plumbing and Electrical Connections

5. START UP

Turn the water on at the stop valve and switch the power on at the plug. Press the POWER ON button at the front of the machine. A red light next to the button will illuminate and the machine will start to fill.

Note: The machine will not heat until the water has reached the low level probe. When the low-level probe is reached the element is switched on this water is heated to the pre-set temperature (93 – 94.5°C). The machine takes in another small body of water, while continuing to heat. This method of staggered filling (heat-fill cycle) ensures that the temperature in the tank remains within 3 degrees of set temperature. This heat-fill cycle continues until: a) the water level reaches the high level probe and

b) the water temperature reaches the pre-set temperature as above.

This may take up to 1 hour.

Note: When the level of water is at a safe height above the low level, the green READY TO BREW light illuminates. The machine is not full at this level. A brew can be selected, but no hot water is available. Unless a brew is selected, the full quantity of hot water should be available within 25minutes of reaching this level.

6. OPERATION

The machine is ready to brew Coffee and 10 pints of Hot Water is available for immediate draw-off when the machine is full and up to temperature.

The machine has one large water tank, with an urn recessed into it. When a brew is selected, hot water is pumped from the tank up to the sprayhead and into the filter basket. The coffee runs out of the filter basket into the urn. Since the water tank surrounds the urn, the brewed coffee is kept at temperature.

The machine works on a heat fill cycle which means that the temperature in the tank does not drop by more than 3 degrees. The machine will only allow small amounts of cold water into the tank, while continuing to heat to ensure that the temperature does not drop too low.

If more hot water is used than the machine can recover (0.48l/min), the amount of water in the tank decreases. If the full quantity of Hot Water is drawn off, the machine will take approximately 25min to recover back up to the high level probe.

Note: a brew can still be selected when no Hot Water is available out of the tap. This is due to a buffer of hot water beneath the level of the 'hot water stand pipe' inside the tank. This should preferably be a half brew rather than a full brew to ensure shorter recovery times. Drawing off Hot Water while brewing Coffee should not affect the quality of the brew.

When the level has dropped to a point where a brew cannot be completed, the ready to brew light goes out and a brew cannot be selected. A 3rd level sensor probe, the 'Brew Level Probe' controls this level. After a recovery period (up to 20min), the machine will be ready to brew once again. Note: a longer recovery is required before any substantial amount of Hot Water can be drawn off.

Brewing Coffee:

- Slide out the coffee filter basket and place a single sheet of filter paper inside
  Put the correct amount of ground coffee into the filter paper. Your coffee supply company may have pack sizes to suit the brews of your new Qwikbrew 2; if not, as an approximate guide for your first brews:
  Try about: 110g-130g (4-4½oz) for a 5 pint brew (2.85 litres)
  220g-260g (8-9oz) for a 10 pint brew (5.7 litres)
  Depending on the coffee grind and roast, and on water quality, you may have to adjust these quantities to obtain the optimum flavour. Level off the surface of coffee by gently shaking the filter basket. See Figures 4 and 5.
- Slide the coffee filter basket into the guide rails in the brew head and push fully home.
- Select the correct brew on the front panel by pressing either the Half Brew button for a 5 pint brew or the Full Brew button for a 10 pint brew. Press the button until the amber light illuminates.
- If you make a mistake press the Power switch to turn the machine off. Wait 3 seconds and turn back on again. Select the correct brew.
- A half brew should take around 4-5min. A full brew should take around 8-10min. These depend on the set up of the machine (factory).
- As soon as possible after brewing – remove the filter paper with the spent grinds. **Note: allow time for all the coffee to drain from the filter basket before removing.**
- A brew can be selected any time the green 'Ready to brew' light is illuminated.

Fig.4 – Filter Basket

Fig.5 – prepared

Hot Water:

- 10 pints of water is available as an immediate draw-off when the machine is full; after this no water is available until the 'heat fill cycle' has recovered. This is to ensure that any water drawn off is at the correct temperature.

Lock Function (see figure 6)

This is to prevent untrained personnel operating the machine, or accidental misuse by trained personnel. If the lock button is pressed for approx. 5 seconds, a red light next to the button will illuminate. At this point the rest of the control board is locked. The machine will operate as normal,

i.e. If it is brewing – it will continue to brew. Once completed another brew cannot be selected, until the lock is disabled.

NOTE: The 'Ready to Brew' light will still be illuminated, but no brew will be able to be selected.

To disable the lock – hold the lock button for 5 seconds once again.
This is a particularly useful function in a self-service environment.

Fig.6 – Display

7. HYGIENE

Like any cooking utensils, the coffee-holding urn of your Qwikbrew 2 must be cleaned properly, regularly.
MARCO recommend cleaning after each day's brewing using a proprietary urn-cleansing compound. MARCO URN CLEANSER is available in 1kg tubs for this purpose. Full instructions are given on each tub.
A large Urn cleaning brush and a small sight-glass cleaning brush are supplied to assist in thorough cleaning.

8. TECHNICAL DATA

Maintenance should be carried out by Marco approved technicians only.

Access to internal components:

The Qwikbrew 2 has been designed with ease of service in mind. All the components (PCB's, inlet solenoid, probes, pump and element) are accessible from the front of the machine. See figure 2 on page 7.
Switch off and unplug machine.
Remove the two mounting screws positioned in the plastic service panel (near the tap spigots - see Figure 7). Pull the bottom of the plastic service panel away from the curved steel panel. Push the service panel down towards the counter, to release the tongue (top edge), from the plastic body. Gently lift away from the taps **(the display board is still connected to the machine! See figure 8)**
Remove curved steel panel by levering the top edge out first.

PCBs: (also see amendments)

Figure 9 shows the PCBs and their connections.

Three PCBs control the functions of the Qwikbrew 2.

1. Main control board (1600321 - P.C.B. Brew Board 2002)
2. Timer board (1600322 - P.C.B. Timer Single 2002)
3. Display controls (1600324 – P.C.B. Brewer Display Board 2002)

P.C.B. Brewer Display Board – 1600324

This PCB consists of four black buttons, five LEDs and three 4-way connectors which connect to the timer board (PCB Timer Single 2002 – 1600322).
The board is screwed into brass inserts mounted in the plastic service panel. These screws should be M4 x 6mm s/s.
Note: Some early models have M3 mounting screws.
When attaching the board to the plastic, ensure that all buttons move freely within the locating holes in the plastic. If they are sticking at all, unscrew slightly and reposition before tightening again.

Note that the ribbon cables are unmarked and care should be taken to connect them correctly.
Ribbon Connections:
1. Display Top (Between Lock [SW1] /Power [SW2]) → Timer Board J1
2. Display Middle (between Power [SW2]/Half brew [SW3])→ Timer Board J2
3. Display Bottom (between Half brew [SW3]/Full brew [SW4])→ Timer Board J3
(See Figure 10)

Fig.7 – Plastic Service Panel

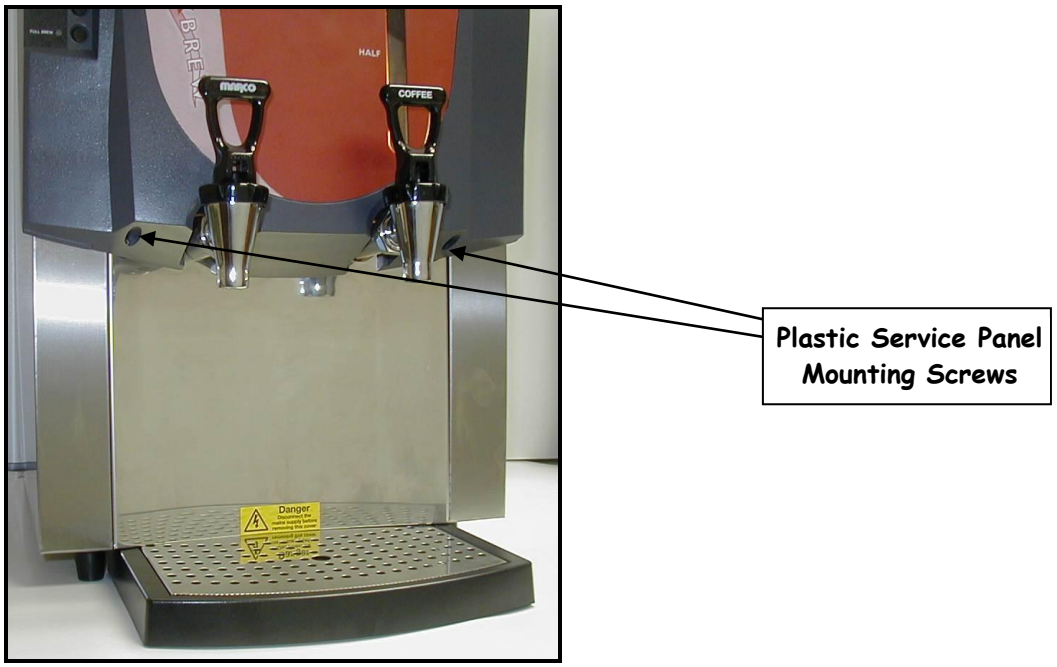


Fig.8 – Plastic Service Panel Removed

Fig.9 – PCB connections

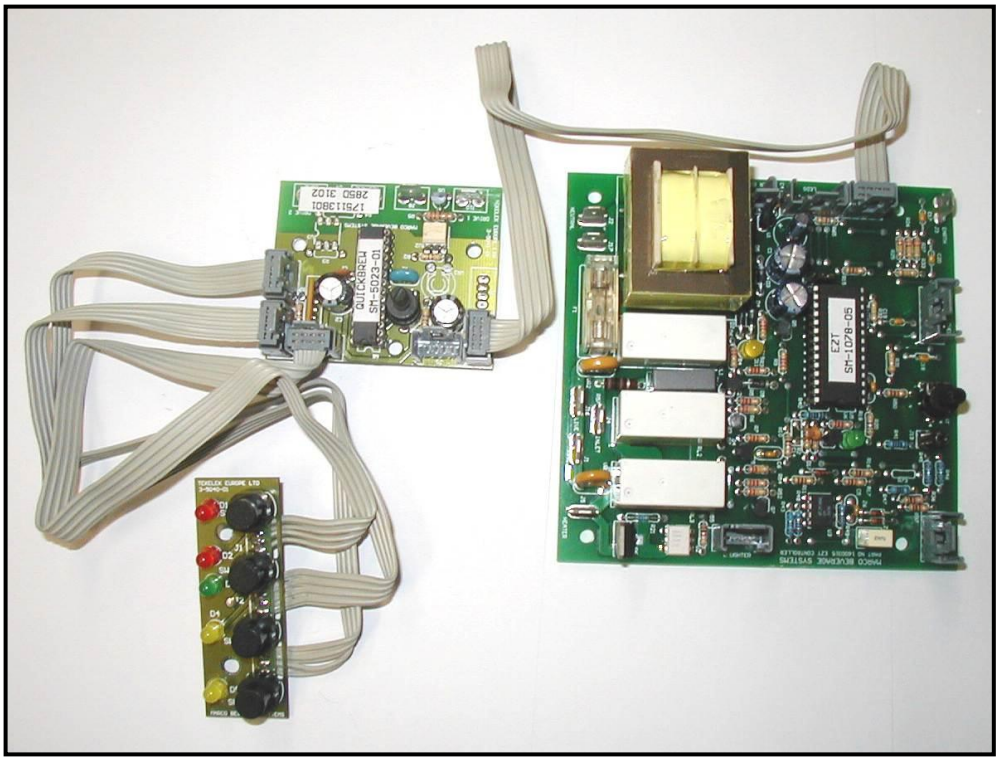
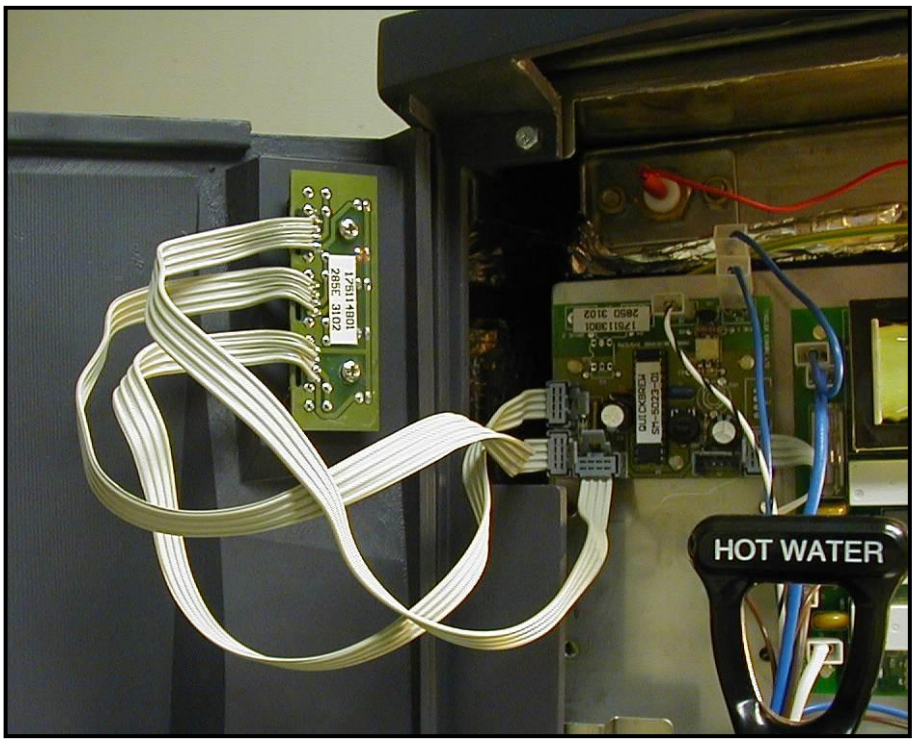


Fig.10 – Display PCB connections



P.C.B. Timer Single 2002 – 1600322

Figure 11 shows a close up of the timer board.
This timer developed in 2002 is a simple timer/pump driver, which uses information supplied by the Brew Board (1600321) to control brewing function.

Ribbon Connection:

1. **Timer Board J6 → Brew Board DATA I/O**

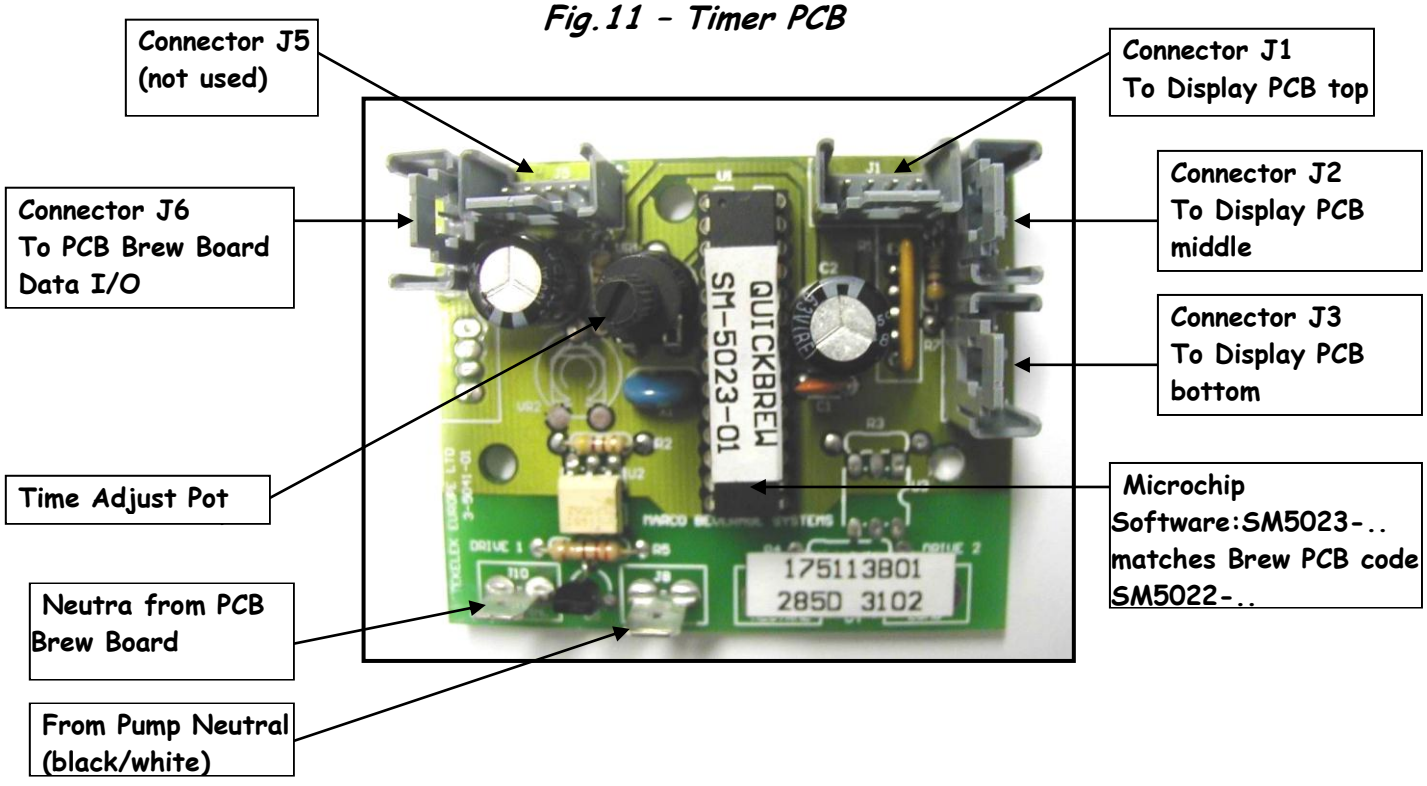
The switching is done using a line driver (triac based - zero voltage switching). This component operates off the neutral from the pump.

Note: The pump has a live wire connected permanently. The switching is done on the return/neutral side.

Adjusting Brew Times:
The pot on the timer board adjusts the half brew time. The full brew time is always double the half brew time. The half brew range is currently set at approx: 3 minutes to 6 minutes. Adjusting clockwise – increases half brew time.
Adjusting anti-clockwise – decreases half brew time.

Note: the first batch of machines (serial no. 08022211 – 08022230) requires that the timer board be reset for changes to take effect. Once the pot has been turned, the machine needs to be switched off and switched on again for the new settings to be saved. The brew times will not change until the machine has been reset.
<u>Machines with serial numbers outside of this range DO NOT need to be reset</u>. The change will automatically be detected before a brew commences.

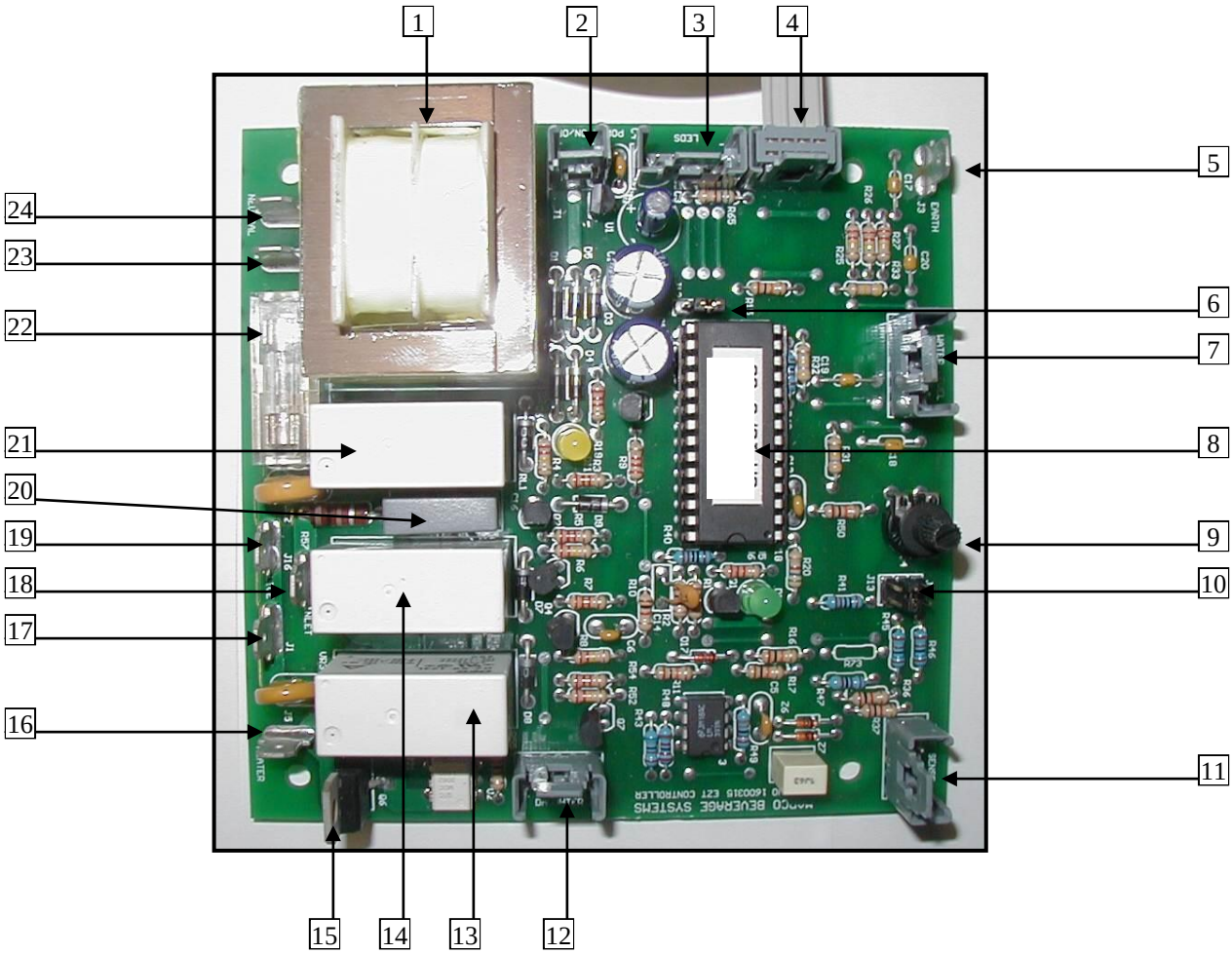
Fig.11 – Timer PCB



P.C.B. Brew Board 2002 – 1600321 (NOTE: also see amendments)

This is a modification to the EZT boiler PCB.
The software code on this PCB (SM1078-05 or SM5022-..) enables it to be used in this brewer or any other standard Marco Boiler – EZT 400/700, Comet2, Aquarius 15, 3/30,6/30,6/45. The jumper J12 (6below) selects either boiler or brewer mode.

Fig.12 – PCB Brew Board 2002



Components of PCB Brew Board 2002 (fig. 12):

1. **Transformer**
2. **Power On/Off – 2way connector**
   - looped on this machine
3. **LEDs - 5way connector**
   - not used on this machine
4. **Data I/O – 4way**
   - connects to timer PCB J6
5. **Earth Tab**
6. **Mode of Operation Jumper**
   - to be positioned closest to the transformer for Boiler mode
   - to be positioned furthest away from transformer for Brewer mode
7. **Water Level – 5way connector**
   - connects to Low level, High level and Brew level probes.

8. **Microchip – version number**
   - **The software code on this microchip is very important. Part no, 1600321 should have the software code SM5022-.. The Timer PCB should have software code SM5023-.. These two PCBs are matched. Subsequent modifications have been made to the PCBs and care should be taken that the Timer and Brewer PCB are matched together. (See amendments)**

9. **Temperature Adjust Pot**
   - to increase temp – adjust clockwise
   - to decrease temp – adjust anti-clockwise
10. **Temperature Range Jumper**
    - controls three temperature ranges
    - should be on the middle pins for boiler/brewer operation
11. **Thermistor Connector**
12. **Daughter PCB Connector**
    - used in 5.6kW machines
13. **Relay - Heater Safety**
    - backup relay for element
14. **Relay – Heater**
    - switches the element

15. **Triac**
    - **controls the switching of relays at zero voltage.**
    - **this lengthens the life of relays, by removing the arc (flash) during switching which wears the contacts on the relay.**

16. **Heater/Element Tab**
17. **Live Tab**
18. **Inlet Solenoid Tab**
19. **Live tab - spare**
20. **Suppressor**
21. **Relay – Inlet Solenoid**
    - switches the inlet solenoid
22. **Fuse**
23. **Neutral tab**
24. **Neutral tab – spare**

General Operation - PCB Brew Board 2002 (software vers. SM5022-..) -1600321

When the machine is switched on, the PCB checks what state the machine is in, by checking probe levels and temperature.
If the low level probe is uncovered, the machine will take in mains water until this probe is in contact with the water.
At this level, the element is switched on and this body of water is heated to the preset temperature (temp adjust pot), approx 93.5-96°C.
More mains water is taken in **(heating does not stop)** until the temperature sensor senses a drop of 1-2 degrees. The machine stops taking in water and allows time for this water to reach preset temperature. This is the Heat-Fill cycle.
This cycle will continue until the high level probe is reached.
If the water level drops off the high level probe, this cycle is repeated.
By using this method, the water in the tank remains between favourable temperature limits. However, this does mean that the machine can run out of hot water.
Note: old versions of the Qwikbrew did not work on the heat fill system, and the level of the water remained at the high level probe regardless of temperature.

In between the low level and high level is a 3rd level probe – 'the brew level probe'.
There is 12-13 pints of water between this level and the low level. A brew of coffee can be started at any point above this level.
A normal full brew is approx. 11 pints of water – so this is a safe level, even in a situation of mains pressure drop. In normal circumstances approx. 6 pints of water is taken in and recovered during a full brew. Therefore, there should always be at least 7 pints of water above the low level cut off.

Approximately 15mm (2 pints) above the Brew level probe is the Hot Water Draw off limit. This is the level in the tank at which the Hot Water tap runs out of water.
A brew can still be selected at this point.
Drawing off water at any time should not affect the brewing system.

Probes:

As mentioned earlier, there are 3 probes (low level, high level and brew level) on the Qwikbrew 2, the positions of which are shown in figure 2.
Figures 13 and 14 show how the probes are removed.
Note: Tank does not have to be drained to remove any probes.
The probes and bracket are sealed against the wall of the tank with 2 M6 nuts that screw onto studs welded to the tank.
Remove these nuts and pull the probe assembly out.

Fig.13- remove nuts

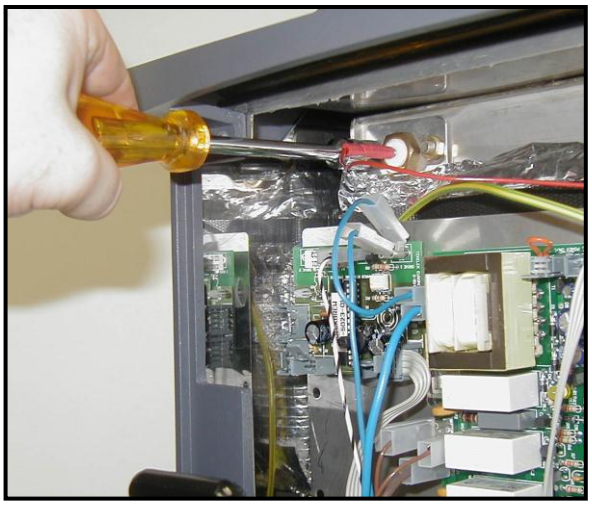


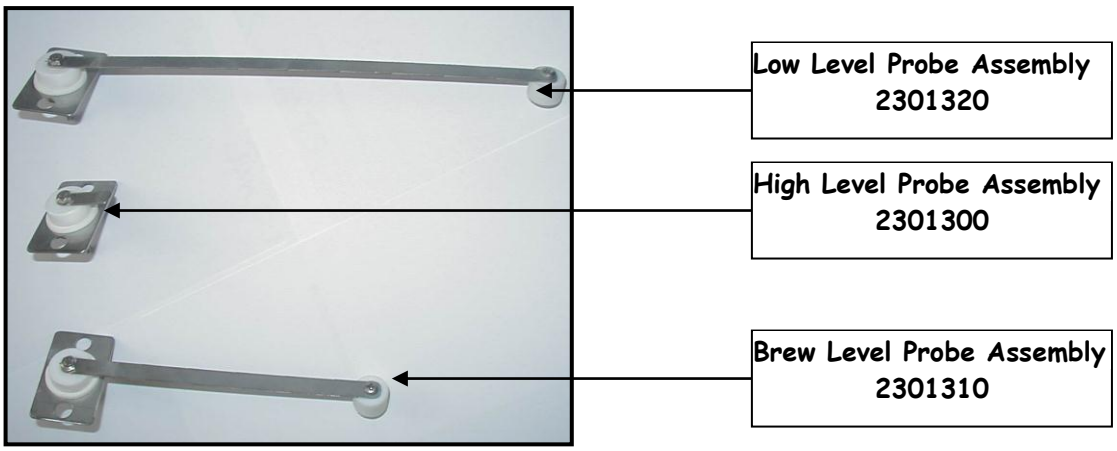
Fig.14 – remove probe

Low Level Probe assembly - 2301320 (see figure 15)
The low level probe is mounted on the sight glass side of the machine, and is connected to the Brew Board PCB with a yellow wire.

High Level Probe assembly - 2301300 (see figure 15)
The high level probe is mounted in the top centre of the tank, and is connected to the Brew Board PCB with an orange wire.

Brew Level Probe assembly - 2301310 (see figure 15)
The brew level probe is mounted on the tank near to timer PCB, and is connected to the Brew Board PCB with a red wire.

Fig.15- probe assemblies



Element:

Figures 16 and 17 show the two types of element used on the Qwikbrew 2. The element shown in figure 16 is used on the first batches of the machine. This is either a 2.8kW 220V or a 2.8kW 240V depending on whether the machine is in Ireland or the UK. Since the European standard voltage is 230V, we are in the process of changing our elements to suit this.
Figure 17 shows the element to be used on new batches of the Qwikbrew 2. This shape of element has a great advantage.

Fig.16

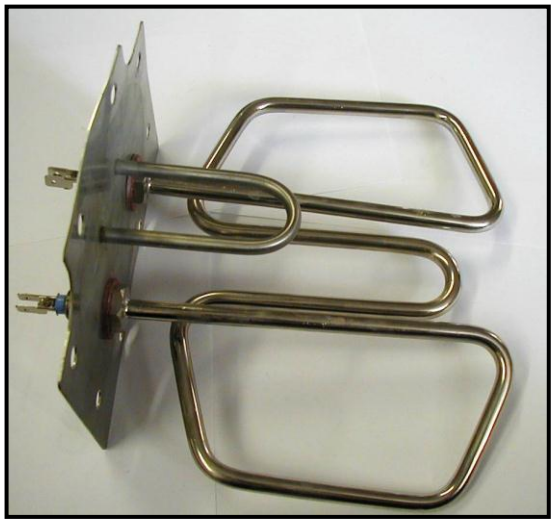
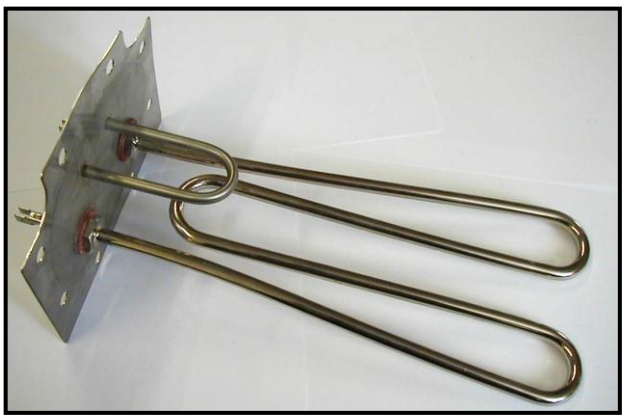


Fig.17



Replacing the Element:

- Switch off the machine and remove the plug from the socket. Drain the tank using the drain valve at the front of the machine (see figure 18).
- Unscrew the 8 M6 nuts that clamp the clean out door against the tank wall. Pull clean out door back and check element. If element is of the type in fig. 16, remove element nuts on the front of the clean out door. Remove clean out door. (If element is of type in figure 17, pull the assembly straight out of the tank.)
- Not the position of the red silicone o-ring - remove and discard. Remove element by sliding one leg out at a time (see figures 21 and 22).
- Replace in reverse order. Use a new red silicone **O-ring (1800770)**. Do not over-tighten M6 nuts. Check that the clean out door is sealed at temperature before leaving site.

De-scaling the tank:

Follow instructions for removing the element. The tank can now be cleaned through the clean out door (see figure 23).

Fig.18

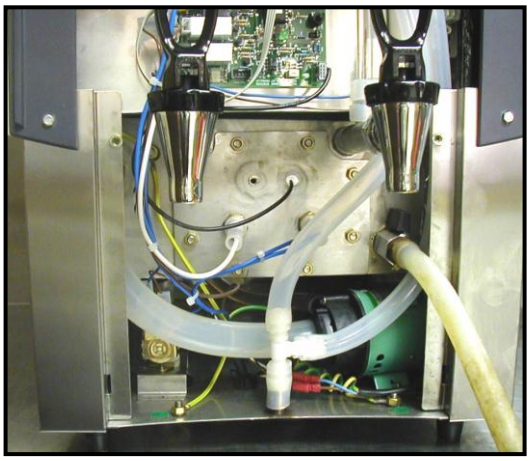


Fig.19

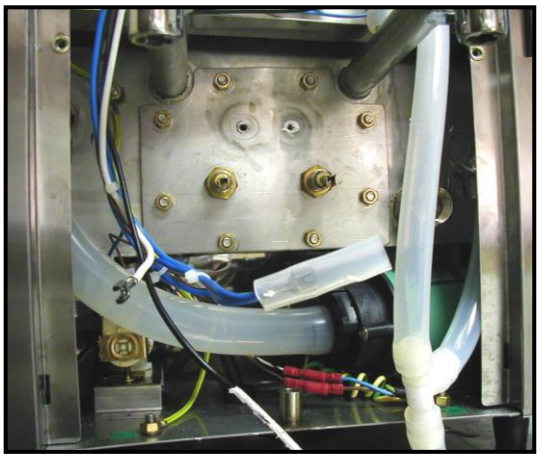


Fig.20

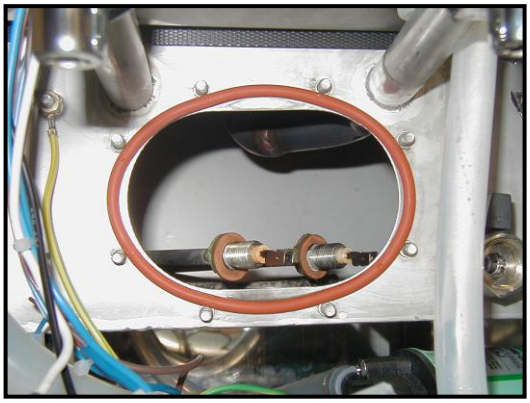


Fig.21

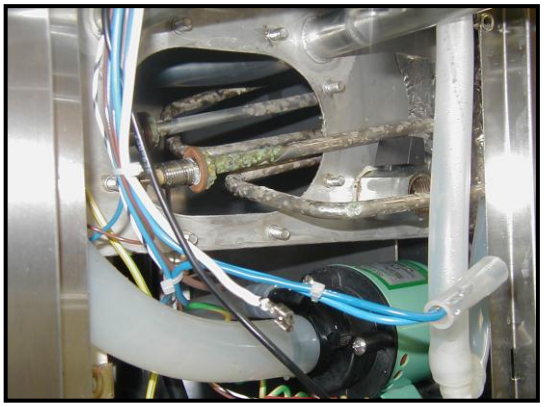


Fig.22

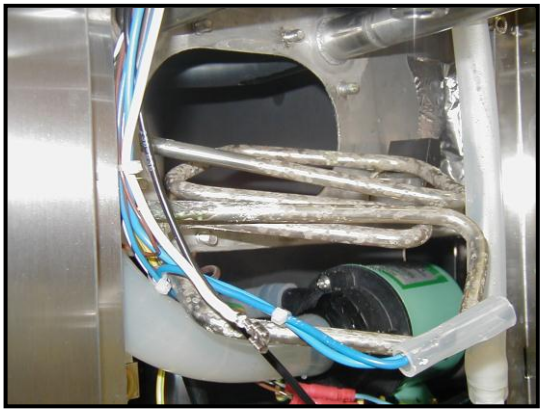
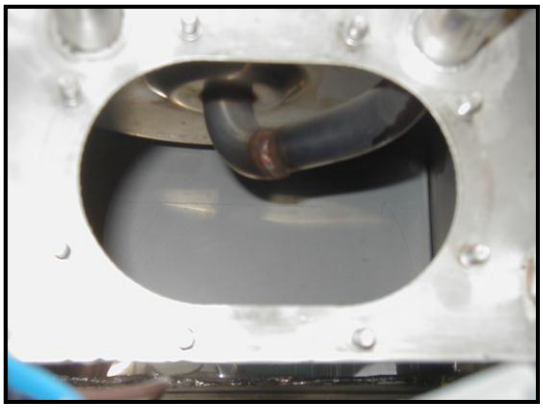


Fig.23



Pipework and Sprayhead:

Figure 24 highlights the hoses and connections at the front of the machine.
Figure 25 details hose connections beneath the tank.
Figure 26 highlights the hoses and connections at the back of the machine.

Fig.24

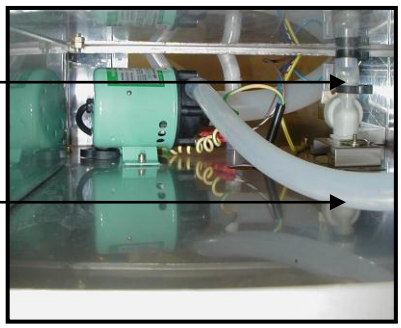
Urn Overflow - to Drip tray

Tank Overflow - to Drip tray

Pump Inlet

Plastic T-piece - 1801250

Fig.25



Inlet Solenoid to Tank
(see amendments)

Pump Outlet to Sprayhead

Fig.26

Hose Clip Restrictor – 1800545 (obsolete - see amendments)

Sprayhead (obsolete - see amendments)

T-piece plastic – 1801255 (obsolete - see amendments)

Pump Outlet to Sprayhead (obsolete - see amendments)

The Sprayhead: (see amendments)

To access the sprayhead, simply pull out the cup rail and lift off the lid (see figures 27, 28 and 29).

Fig.27

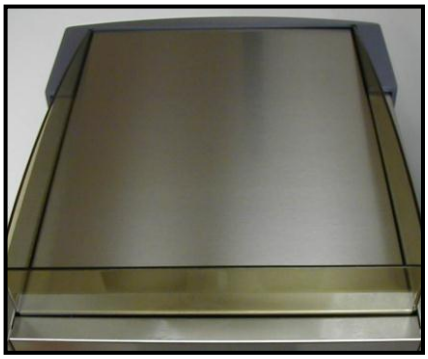
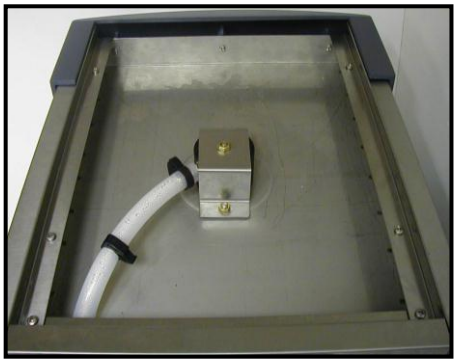


Fig.28

Fig.29(see amendments)



The pump feed to the sprayhead is shown in figure 26.
A length of silicone hose (12mmID) connects the pump to a T-piece (either stainless steel or high temp plastic – plastic to be standard on future machines). A short length of hose connects the T-piece to a stainless steel tube welded to the tank. Another piece of hose connects the T-piece to the sprayhead.
There are currently two types of sprayhead on the Qwikbrew 2:

The adjustable sprayhead is shown in figure 30. (obsolete – see amendments)
This has a ball valve attached to the sprayhead - opening or closing the valve can adjust the flow. These sprayheads will not be used on future models.

The standard sprayhead is shown in figure 31. (obsolete – see amendments)
This sprayhead has a tail-piece connection with an 8mmID silicone tubing sleeve attached to it. This acts like a reducer, so that the 12mmID hose can connect to the tailpiece. Small pieces of this 8mmID silicone hose might be positioned inside the larger hose at the inlet and outlets of the T-piece. **These act as restrictors and help control the flow rate.**
The other control restrictor is a black hose clip type E (1800545). This fits around the silicone hose feeding to the sprayhead. The flow can be adjusted by closing the hose clip.

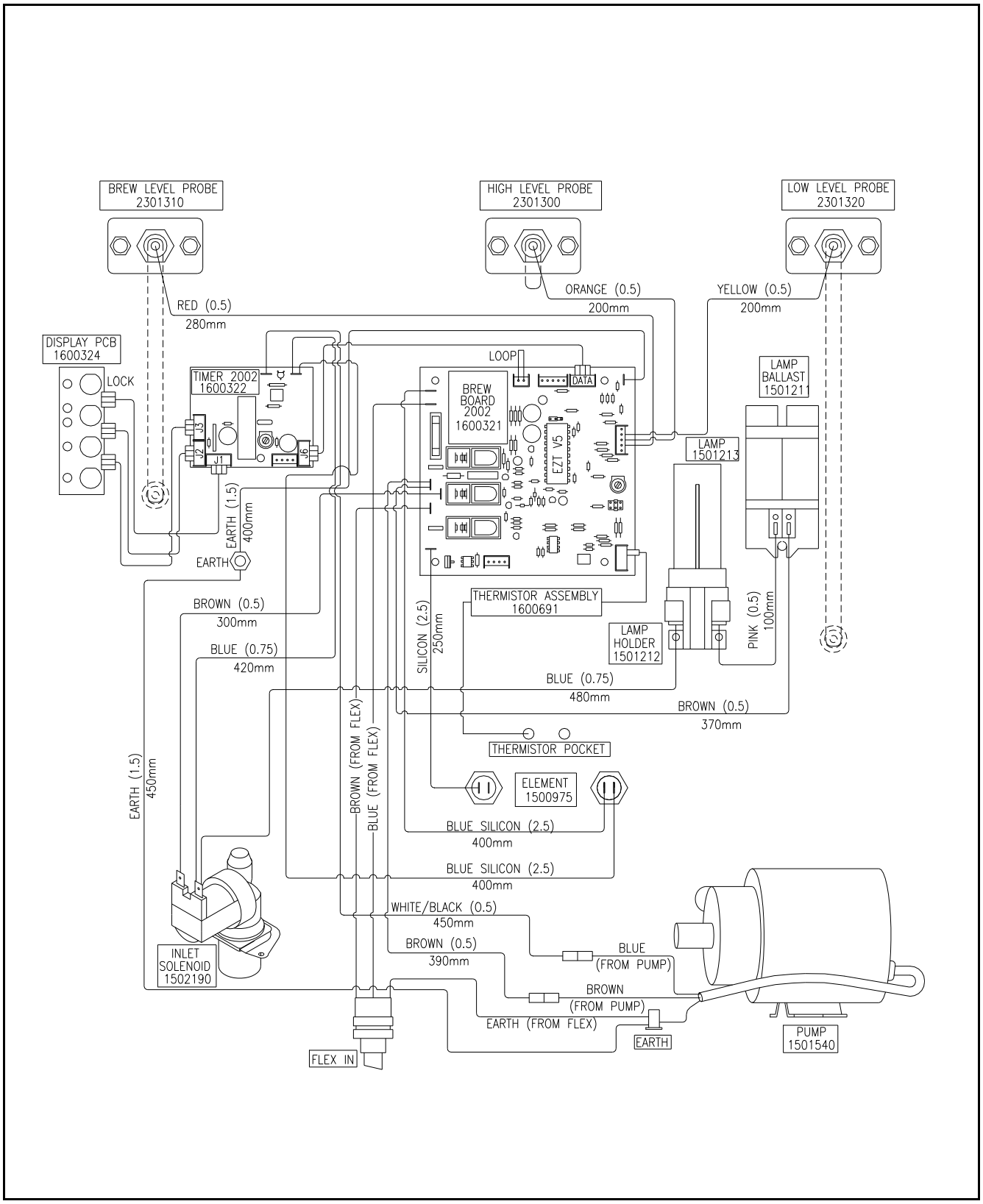
There are no restrictors of the type found on previous Marco brewers. The flow rate is controlled by pipe work and in some cases hose clips. The larger bores in the hoses should prevent failures due to scale blockages.

Fig.30 (obsolete)

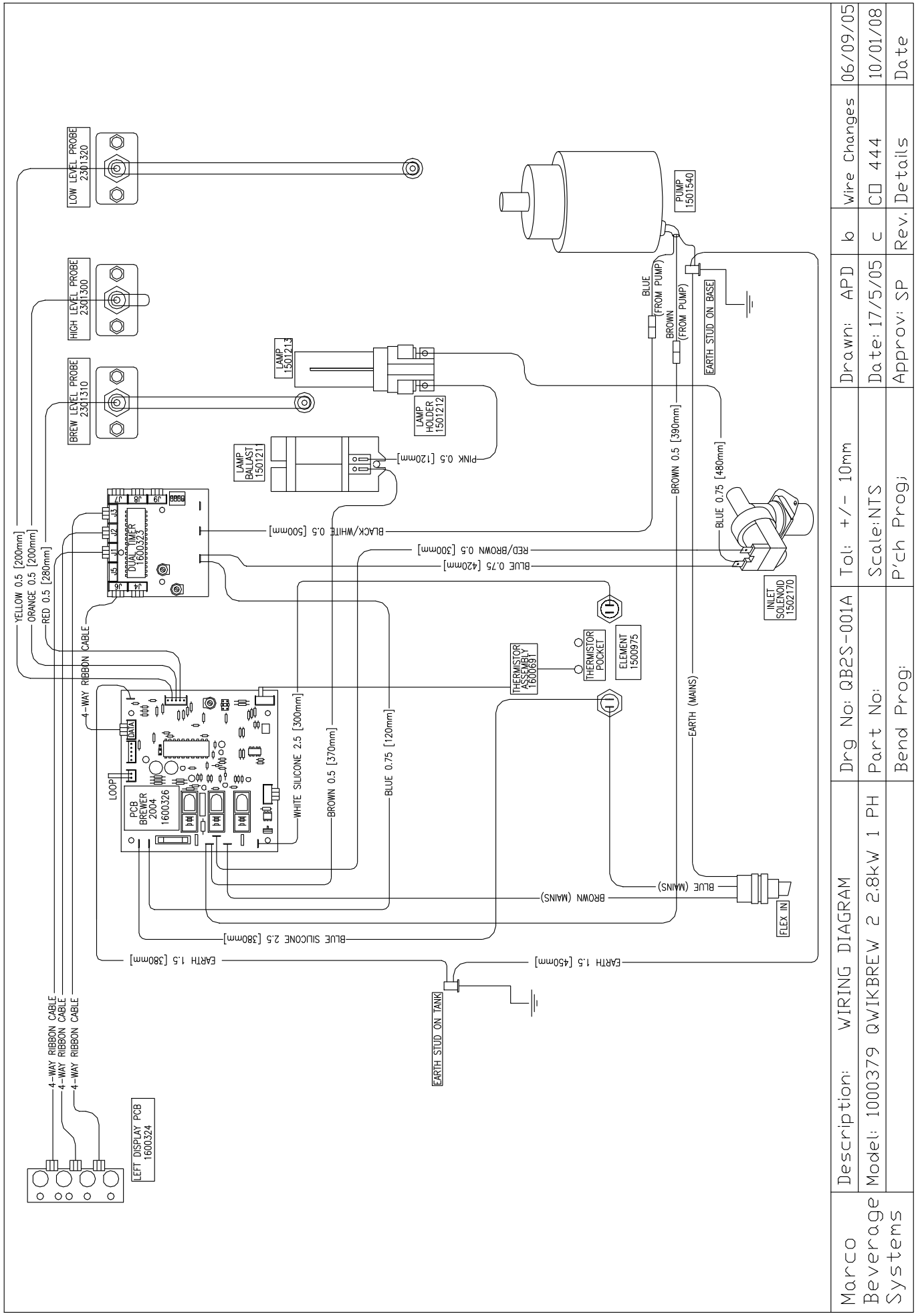
Fig.31

9. WIRING DIAGRAMS (also see amendments):

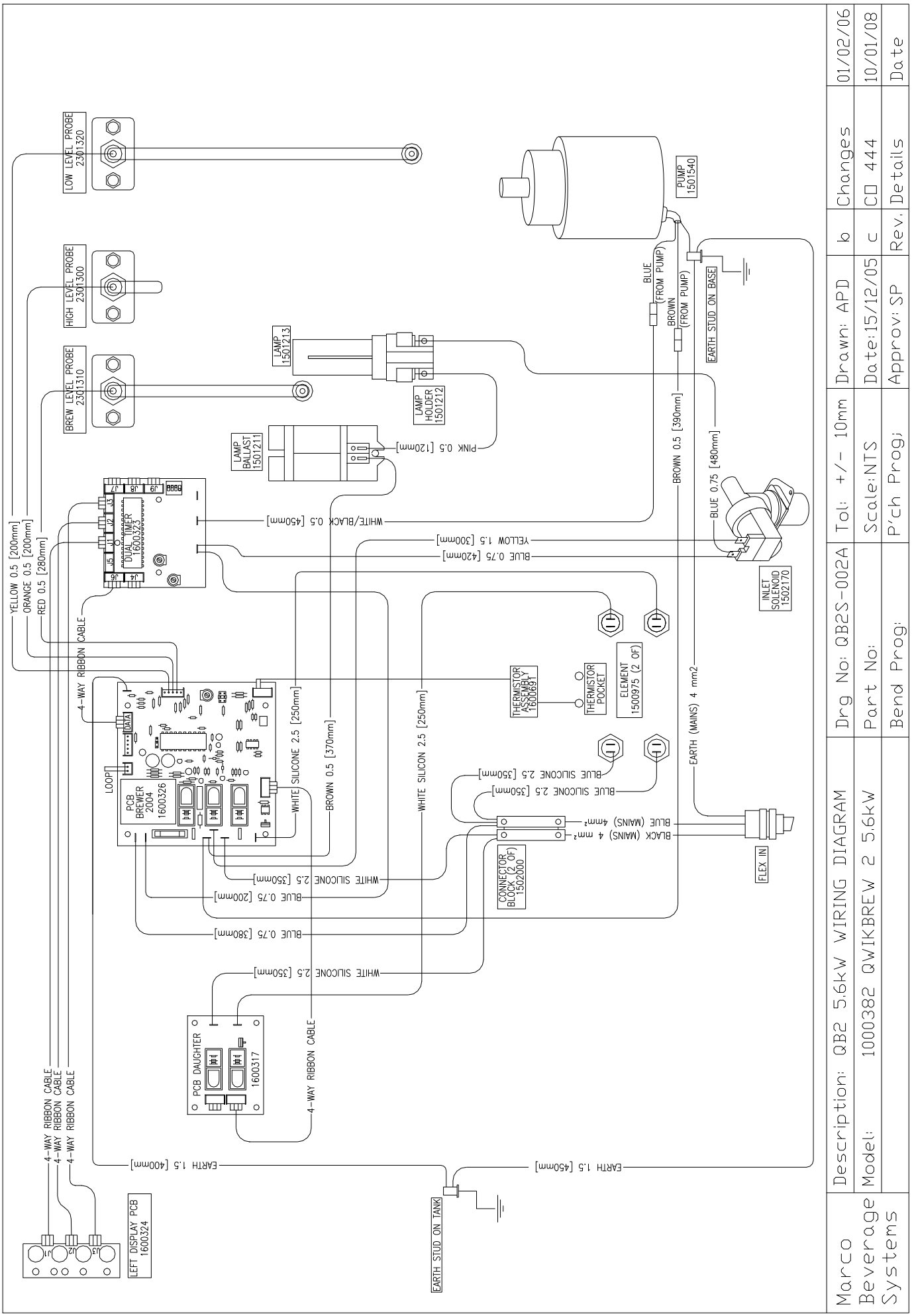
Wiring diagram for 2.8kW machines with serial numbers up to 04031237



Wiring diagram for 2.8kW machines with serial numbers from 10040001

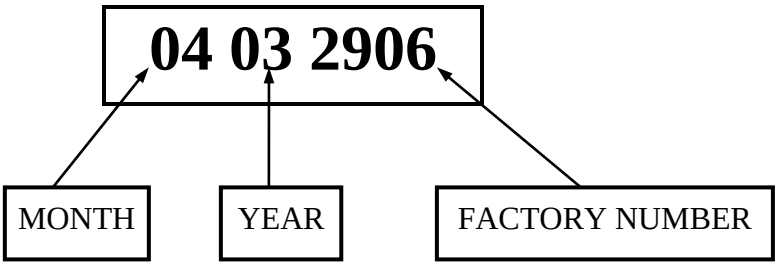


Wiring diagram for 5.6kW machines



AMENDMENTS

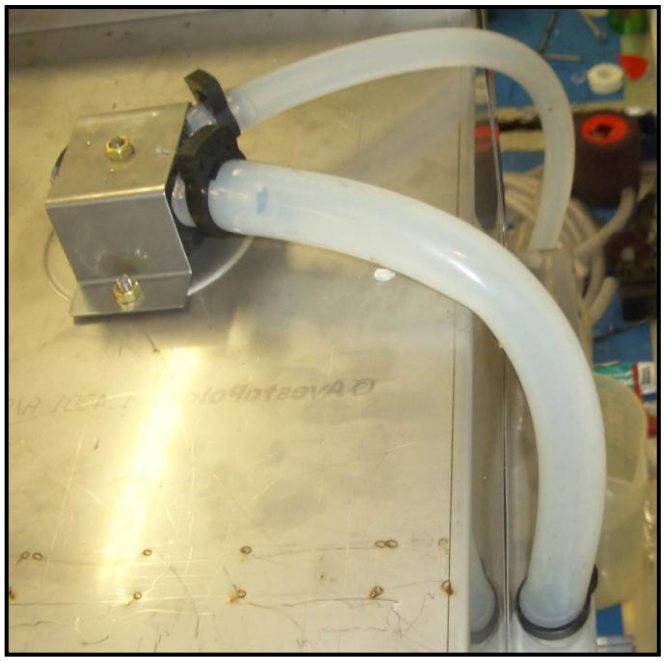
NOTE: The first four digits of the serial number denote the month and year of manufacture. The remaining four digits represent a factory assigned sequential serial number. This is important for identifying machine versions. See example below.



Machines with serial numbers 04031237 to 10040001:

These machines have the following modifications:

1. The inlet solenoid valve is the right-angled type - **Part no. 1502170**. This replaces **Part no. 1502190**.The inlet hose from the inlet connects to an elbow welded to the bottom of the tank.
2. The sprayhead design is the flow through type. The sprayhead has two pipes attached to it. The small pipe comes directly from the pump. The large silicone tube is the bypass and feeds back into the hot water tank. See the picture below.



Sprayhead Complete – part no. 1401550

AMENDMENTS (cont):

Machines with serial numbers 10040001 - present:

These machines have the following modifications:

1. The **PCB Brew Board 2004 (software: SM5029-..) - Part No. 1600326** replaces the **PCB Brew Board 2002 (software: SM5022-..) – Part No. 1600321.** This PCB is essentially the same, but with new software on the microchip.
   The **PCB Timer Dual 2004 (software: SM5023-..) – Part No. 1600323** replaces the **PCB Timer Single 2002 (software: SM5023-..) – Part No. 1600322.**
   These PCBs allow the brewer to be operated in heat-fill mode or continuous fill mode. The software has been modified so that the error diagnostic signals can be displayed by flashing the red Power On/Off LED.

The following section details the PCB change.

Qwikbrew2 PCB modification:

Electronics modification: Timer and Brew Board Replacement

Marco are currently phasing out the PCB brew board 2002 (Part No. 1600321) and the PCB Single Timer (Part No. 1600322). These are found on all Qwikbrew 2 machines produced to date.
Future batches of Qwikbrew 2 machines will use the PCB Brew Board 2004 (Part No. 1600326) and the PCB Dual Timer (Part No. 1600323) as standard.

Note that the TIMER-MAIN PCB (Brew Board) combination is critical. The software codes are linked between the Timer and the Brew board PCB.
Therefore, if a timer PCB is replaced with the new version, the Main PCB (or microchip) should be replaced too. The machine will not operate unless the Timer and Main PCB combination is correct.

Each PCB has a label on the microchip, which has the software code version printed on it. These software codes and corresponding part no's are detailed below:

Obsolete PCB combination (being phased out):
1600321 – PCB Brew Board 2002 – (software code SM5022-..)
1600322 – PCB Timer Single – (software code SM5023-..)

New PCB combination:
1600326 – PCB Brew Board 2004 – (software code SM5029-..)
1600323 – PCB Timer Dual – (software code SM5030-..)

The procedure for changing the Timer PCBs is detailed on the following pages.

AMENDMENTS: Machines with serial numbers 10040001 - present:

Modification of Qwikbrew 2 – replacing the Single Timer with the Dual Timer:

1. Press the power button to switch the machine off.
2. Unplug the machine.
3. Disconnect the Display PCB (1600324) ribbon cable links from the Single Timer PCB (1600322). Disconnect the Brewer PCB (1600321) ribbon cable link from the Single Timer PCB (1600322). Disconnect the spade terminals from the Single Timer PCB (1600322). See Fig.1 below.
4. Remove Single Timer PCB (1600322).

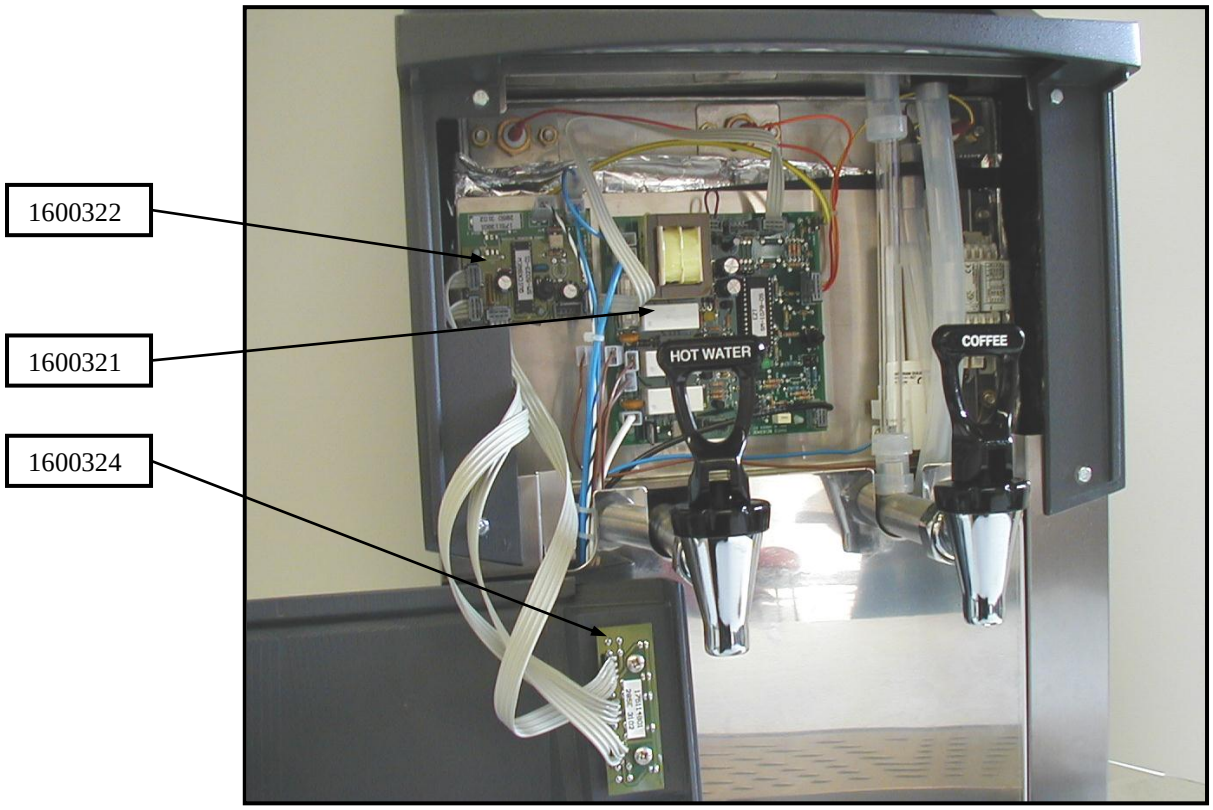


Fig.1

5. Fit the new Dual Timer PCB (1600323) into position. This can only be fitted one way. The mains connectors will be at the top. Ensure that the PCB is pressed firmly on to the pillar supports (this is necessary to keep a good clearance between the mains terminals and PCB bracket). See Fig.2 below.

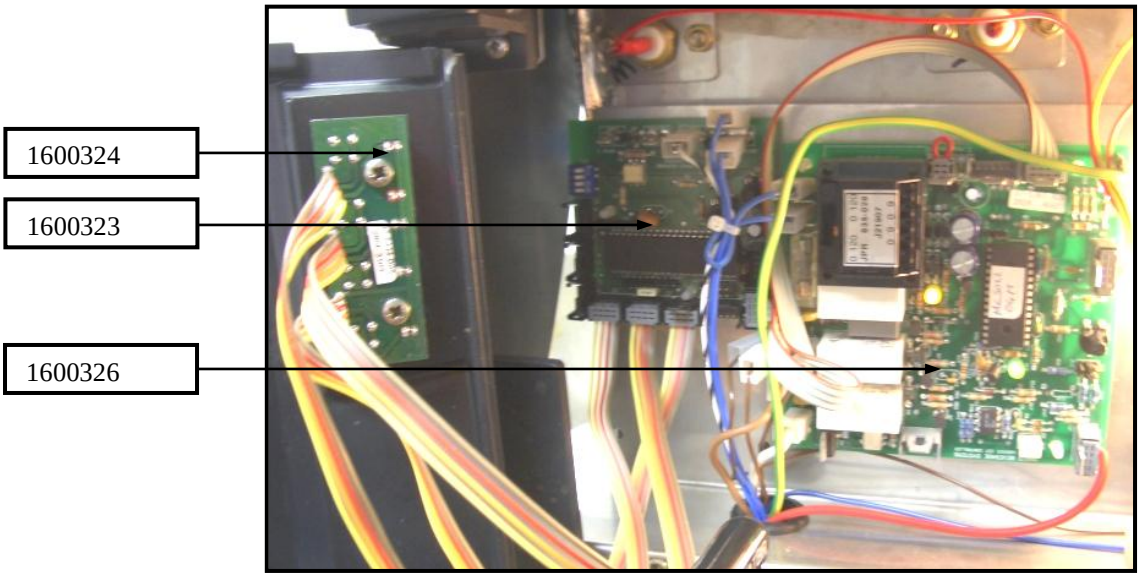


Fig.2

6. Reconnect the Display PCB (1600324) as follows:
   The top ribbon cable to J1 on the Dual Timer PCB (1600323).
   The middle ribbon cable to J2 on the Dual Timer PCB (1600323).
   The bottom ribbon cable to J3 on the Dual Timer PCB (1600323).
   See Fig.2 and Fig.3.
7. Reconnect the ribbon cable from the Brewer PCB (1600321) Data I/O to J6 on the Dual Timer PCB (1600321). See Fig.2 and Fig.3.
8. Reconnect the spade terminals as shown in Fig.2 and Fig.3.
9. The selector switches should be in the positions shown in the inset in Fig.3.

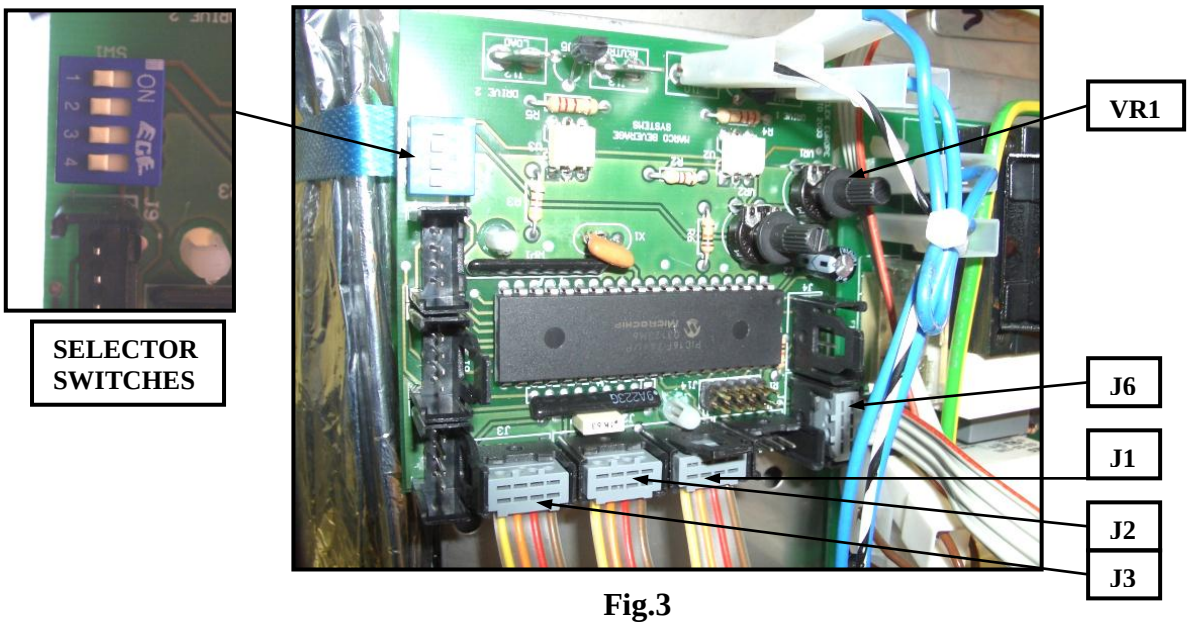


Fig.3

NOTE: Whenever the Dual Timer 1600323 replaces the single timer 1600322, a new main Brewer PCB 1600326 is required. The existing PCB 1600321 on the unit can be converted to the new PCB 1600326 by replacing the main microchip on the PCB.
If a microchip has been supplied, carefully remove the microchip from the Brewer PCB (1600321) and replace with the new chip. Ensure that the chip is inserted the correct way – the semi circle groove should be at the bottom. NOTE: THESE COMPONENTS ARE FRAGILE AND SHOULD BE HANDLED WITH CARE.
This new chip contains the software to drive the Dual Timer ***PCB and contains code that allows the machine to be used in*** **Heat-Fill mode** or **Continuous Fill** mode. The position of the Jumper J12 above the microchip determines the mode of operation. For Heat fill mode, the jumper should be positioned nearest the transformer. For Continuous Fill mode, the jumper should be positioned furthest away from the transformer. Fig.4 shows the jumper in Continuous Fill mode.

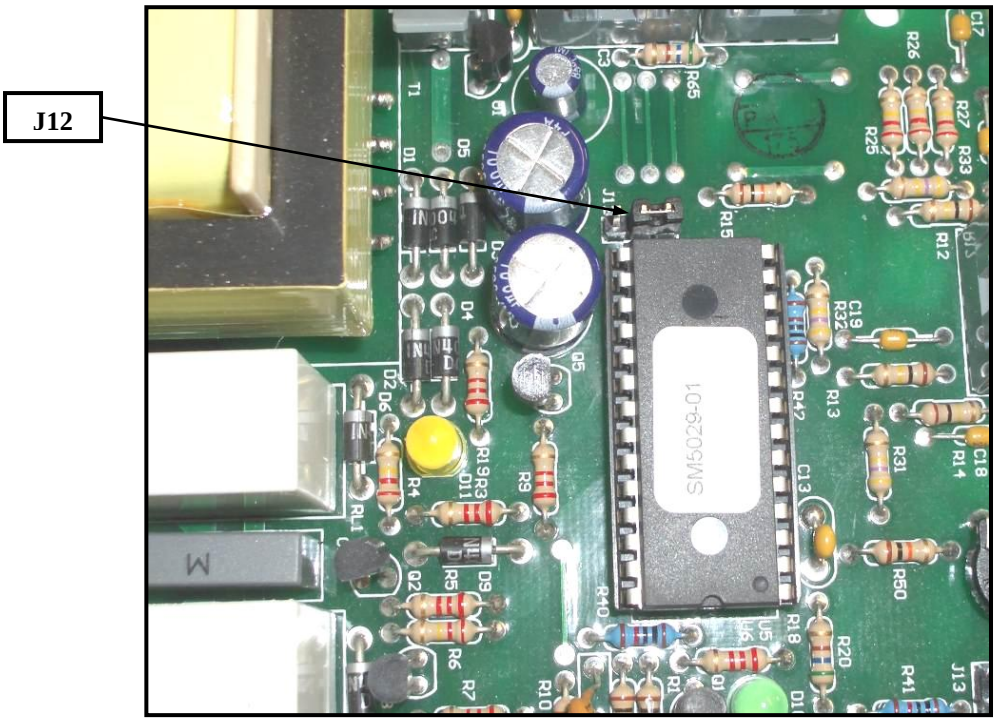


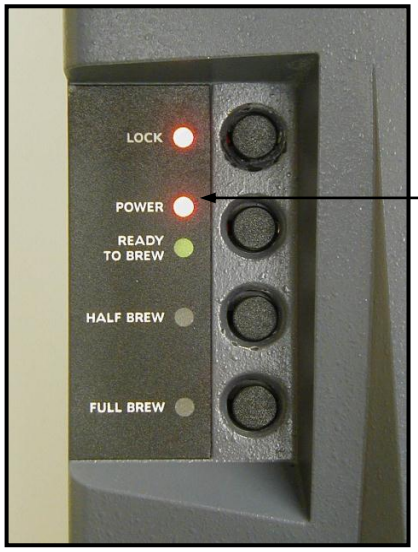
Fig.4

The software version on the Brewer PCB microchip should be version **SM5029-01 or above (SM5029-02 or SM5029-03 etc).**
Note that the temperature may need to be reset on the machine.
The Half brew time can be adjusted through VR1 on the Dual Timer PCB (1600323). Increase the Half brew time by turning VR1 clockwise. To decrease the brew time – anticlockwise. The Full brew time is double the Half brew time.

AMENDMENTS: Machines with serial numbers 10040001 – present

Diagnostic indication

Any Qwikbrew 2 machine fitted with the **PCB Brew Board 2004–Part No. 1600326 (software code: SM5029-..)** and **PCB Dual Timer-Part No. 1600323 (software code: SM5030-..)**, will display error signals via flashes of the Power LED.



This LED will flash when an error is detected. The number of flashes in a cycle references a particular problem. This is

TROUBLESHOOTING – DIAGNOSTIC GUIDE:

If an error is detected a sequence of flashes is displayed through the POWER LED. The length of time and recovery method of each of these flashing displays is detailed below:

2 Flash Cycle – below low level

Display pattern:

2 quick flashes then a short pause - repeated.

Electronic check and action:

- This indicates that the low level circuit is open i.e. the probe is not in contact with the water.
- The element is switched OFF at this stage and the inlet is left ON. (note that if this is a low probe wiring fault, the water will stop at the high level probe regardless of the status of the low level).
- This is a recoverable error i.e. the machine does not need to be reset when the problem is solved. (e.g. if a closed mains water stop valve is the problem, opening the valve will allow water into the machine and normal function will resume when the low level probe is reached)

Probable causes:

1. The water level is below the low level probe, which is normal when the machine fills for the first time. (Can be flashing for up to 5 min at start up)
2. The low level probe wire is disconnected, or there is another wiring fault (eg. a bad earth (return) connection between the PCB and the Tank)

Action required:

1. Check that the water pressure is OK and ensure that the stop valve is open.
2. Check that the inlet solenoid is working.
3. If the water level is above the level of the low probe, check the probe circuit wiring

3 Flash Cycle – thermistor open circuit

Display pattern:
3 quick flashes then a long delay (up to 15 seconds) - repeated.
Electronic check:

- This indicates that the Thermistor is measuring such a large resistance that it assumes the thermistor circuit is open.
- The element and inlet valve are turned OFF when this error is detected
- This is a recoverable error. When the correct range of resistance is measured, normal operation resumes

Probable causes:

1. The thermistor probe is unplugged from the 4way connector on the PCB or the thermistor has failed open circuit.

Action required:

1. Check that the thermistor is plugged in to the PCB correctly. If it is, replace the thermistor.

4 Flash Cycle (Heat Fill Mode Only) – NOT HEATING

Display pattern:
4 quick flashes then a short pause - repeated.
Electronic check:

- This checks that the temperature is increasing when the heater is on.
- Measures the rate that the temperature increases in a specified time. This error is only displayed after 20 mins of the heater being on continuously. When the error is detected, the element and inlet valve are turned off.
- This is a non recoverable error. The machine needs to be reset when this problem is solved.

Probable causes:

1. All the elements have failed
2. Wiring fault

Action required:

1. Check that the resistance on the elements. If there is a reasonable resistance (15-25Ω)on the element it probably has not failed, so the wiring might be at fault. NOTE: for this error to be displayed all elements would have to fail.

5 Flash Cycle – THERMISTOR SHORT CIRCUIT

Display pattern:
5 quick flashes then a short pause - repeated.
Electronic check:

- This indicates that the Thermistor is measuring zero resistance. It assumes the thermistor has failed sort circuit.
- The element and inlet valve are turned OFF when this error is detected
- This is a recoverable error. When the correct range of resistance is measured, normal operation resumes.

Probable causes:

1. The thermistor has failed.

Action required:

1. Replace the thermistor.

6 Flash Cycle (heat Fill Mode Only) – NOT FILLING

Display pattern:

6 quick flashes then a short pause - repeated for approx 2min. Then normal function resumes for 1min30secs – then flashes for 2min again – this cycle is repeated.

Electronic check:

- This checks that the inlet solenoid valve is not kept ON for more than 1min30secs when in the heat fill cycle. Note: this error is only checked once the water level has reached the low level probe and the machine has begun the heat fill cycle.
- This is a recoverable error. In the heat fill cycle, even with reasonably low water pressure the inlet solenoid valve usually only stays ON for approx 5-6 seconds. If the inlet valve stay ON for more than 1min30secs, there is a problem with the inlet valve or the mains water supply. After 1min30seconds the 6 flash cycle is displayed for 2min – the inlet solenoid valve is turned OFF during this time. After this 2min cycle, normal operation resumes i.e. the machine attempts to fill by opening the inlet solenoid valve once more. If after 1min30secs no water has come into the machine, the 6flash sequence is displayed again. This cycle is repeated.

Probable causes:

1. Mains water pressure problem or the mains water stop valve is closed.
2. Inlet solenoid valve failure.

Action required:

1. Check the mains water supply. If it is good, wait 5 minutes to check that the error cycle is continuing.
2. If the mains water supply is good, check that the inlet solenoid valve is working.

11. PART LISTS

Machines with serial numbers before 04031237

PART NO.	DESCRIPTION
1801510	CUP RAIL
1900690	LABEL HEADER MARCO
1900700	LABEL FACE
1900695	LABEL BLANK CLEAR (SIGHTGLASS)
1900710	LABEL DISPLAY/CONTROLS
1801480	PLASTIC BODY
1801490	PLASTIC SERVICE FACE
1801436	PLASTIC DRIP TRAY COMPLETE (BLACK)
2300085	BASKET COMPLETE
2300350	URN LID
2100295	TAP 'COFFEE' COMPLETE
2100275	TAP 'HOT WATER' COMPLETE
1401170	3/4" BSP CHROME NUT FOR TAP
1400550	CIRCLIP FOR TAP
1600324	PCB DISPLAY QB2
1600322	PCB TIMER SINGLE 2002 (SM5023-..)
1600321	PCB BREW BOARD 2002 (SM5022-..)
1600691	THERMISTOR ASSEMBLY
2301320	PROBE LOW LEVEL QB2 SINGLE
2301310	PROBE BREW LEVEL QB2 SINGLE
2301300	PROBE HIGH LEVEL QB2
1700260	SIGHTGLASS
1501213	LAMP
1501212	LAMPHOLDER
1501211	LAMP BALLAST
2100100	DRAIN VALVE
1400990	LOCKNUT 1/2" BSP BRASS (DRAIN VALVE)
1402370	COPPER WASHER (FOR DRAIN VALVE)
1501540	PUMP NIKKISO
1801250	TEE PIECE PLASTIC OVERFLOW
1801255	TEE PIECE PLASTIC (TO SPRAYHEAD)
1800545	HOSE CLIP TYPE E (SMALL - FOR RESTRICTOR)
1800540	HOSE CLIP TYPE F (FOR T-PIECES, SPRAYHEAD ETC.)
1800555	HOSE CLIP TYPE M (LARGE - FOR PUMP INLET)
1502190	VALVE INLET SOLENOID
1500975	ELEMENT 2.8KW 230V (IF AVAILABLE)
1800770	O-RING 4" RED SILICONE (FOR CLEANOUT DOOR)
1801195	SPRAYHEAD COMPLETE
1801200	STRAIN RELIEF BUSH (FOR ELECTRICAL CORD)
1800190	FEET NYLON
1401800	SCREW PLASTITE FOR FEET
8000150	FILTER PAPER
1800690	WATER INLET HOSE
8000240	URN CLEANSER
1700010	URN BRUSH
1700000	SIGHTGLASS BRUSH

Machines with serial numbers 04031237-10040001

PART NO.	DESCRIPTION
1801510	CUP RAIL
1900690	LABEL HEADER MARCO
1900700	LABEL FACE
1900695	LABEL BLANK CLEAR (SIGHTGLASS)
1900710	LABEL DISPLAY/CONTROLS
1801480	PLASTIC BODY
1801490	PLASTIC SERVICE FACE
2300299	DRIP TRAY COMPLETE (255mmX186mm)
2300085	BASKET COMPLETE
2300350	URN LID
2100295	TAP 'COFFEE' COMPLETE
2100275	TAP 'HOT WATER' COMPLETE
1401170	3/4" BSP CHROME NUT FOR TAP
1400550	CIRCLIP FOR TAP
1600324	PCB DISPLAY QB2/MB2
1600322	PCB TIMER SINGLE 2002 (SM5023-..)
1600321	PCB BREW BOARD 2002 (SM5022-..)
1600691	THERMISTOR ASSEMBLY
2301320	PROBE LOW LEVEL QB2 SINGLE
2301310	PROBE BREW LEVEL QB2 SINGLE
2301300	PROBE HIGH LEVEL QB2
1700260	SIGHTGLASS
1501213	LAMP
1501212	LAMPHOLDER
1501211	LAMP BALLAST
2100100	DRAIN VALVE
1400990	LOCKNUT 1/2" BSP BRASS (DRAIN VALVE)
1402370	COPPER WASHER (FOR DRAIN VALVE)
1501540	PUMP NIKKISO
1801250	TEE PIECE PLASTIC OVERFLOW
1800540	HOSE CLIP TYPE F (FOR T-PIECES, SPRAYHEAD ETC.)
1800555	HOSE CLIP TYPE M (LARGE - FOR PUMP INLET)
1502170	VALVE INLET SOLENOID - 90deg
1500975	ELEMENT 2.8KW 230V M-SHAPE
1800770	O-RING 4" RED SILICONE (FOR CLEANOUT DOOR)
1402550	SPRAYHEAD COMPLETE
1801200	STRAIN RELIEF BUSH (FOR ELECTRICAL CORD)
1800190	FEET NYLON
1401800	SCREW PLASTITE FOR FEET
8000150	FILTER PAPER
1800690	WATER INLET HOSE
8000240	URN CLEANSER
1700010	URN BRUSH
1700000	SIGHTGLASS BRUSH

Machines with serial numbers 10040001- present

PART NO.	DESCRIPTION
1801510	CUP RAIL
1900690	LABEL HEADER MARCO
1900700	LABEL FACE
1900695	LABEL BLANK CLEAR (SIGHTGLASS)
1900710	LABEL DISPLAY/CONTROLS
1801480	PLASTIC BODY
1801490	PLASTIC SERVICE FACE
1801436	PLASTIC DRIP TRAY COMPLETE (BLACK)
2300085	BASKET COMPLETE
2300350	URN LID
2100295	TAP 'COFFEE' COMPLETE
2100275	TAP 'HOT WATER' COMPLETE
1401170	3/4" BSP CHROME NUT FOR TAP
1400550	CIRCLIP FOR TAP
1600324	PCB DISPLAY QB2/MB2
1600323	PCB TIMER DUAL 2004 (SM5030-..)
1600326	PCB BREW BOARD 2004 (SM5029-..)
1600691	THERMISTOR ASSEMBLY
2301320	PROBE LOW LEVEL QB2 SINGLE
2301310	PROBE BREW LEVEL QB2 SINGLE
2301300	PROBE HIGH LEVEL QB2
1501191	HARNESS PROBE QB2 SINGLE & TWIN
1700260	SIGHTGLASS
1501213	LAMP
1501212	LAMPHOLDER
1501211	LAMP BALLAST
2100100	DRAIN VALVE
1400990	LOCKNUT 1/2" BSP BRASS (DRAIN VALVE)
1402370	COPPER WASHER (FOR DRAIN VALVE)
1501540	PUMP NIKKISO
1801250	TEE PIECE PLASTIC OVERFLOW
1800540	HOSE CLIP TYPE F (FOR T-PIECES, SPRAYHEAD ETC.)
1800555	HOSE CLIP TYPE M (LARGE - FOR PUMP INLET)
1502170	VALVE INLET SOLENOID - 90deg
1500975	ELEMENT 2.8KW 230V M-SHAPE
1800770	O-RING 4" RED SILICONE (FOR CLEANOUT DOOR)
1402550	SPRAYHEAD COMPLETE
1801200	STRAIN RELIEF BUSH (FOR ELECTRICAL CORD)
1800190	FEET NYLON
1401800	SCREW PLASTITE FOR FEET
8000150	FILTER PAPER
1800690	WATER INLET HOSE
8000240	URN CLEANSER
1700010	URN BRUSH
1700000	SIGHTGLASS BRUSH